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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,240	08/01/2006	Takashi Abe	5453-061931	8244
28289 7590 10/23/2008 THE WEBB LAW FIRM, P.C. 700 KOPPERS BUILDING 436 SEVENTH AVENUE PITTSBURGH, PA 15219				
EXAMINER				
ANGWIN, DAVID PATRICK				
ART UNIT		PAPER NUMBER		
3729				
MAIL DATE		DELIVERY MODE		
10/23/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/588,240

Applicant(s)

ABE ET AL.

Examiner

DAVID P. ANGIN

Art Unit

3729

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/08)
Paper No(s)/Mail Date 6/16/08
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

The requirement for restriction is withdrawn.

Claim Rejections – 35 USC § 103

The following is a quotation of 35 U.S.C. § 103(a) that forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically taught or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. § 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 3, and 5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Barber et al* (US Patent Publication 2002/0022292) in view of *Hwu et al* (US Patent Publication 2004/0016718).

- a. *Barber et al* discloses the following in his reference:
- i. applying a masking agent to a surface of a piezoelectric material to form a film of the masking agent on the surface of the piezoelectric material (Figs. 3 and 7-9);

- ii. patterning the film of the masking agent into a predetermined masking pattern (Fig. 3);
 - iii. holding the film in contact with a vapor of a solvent (30:1-13) for the masking agent, so as to fluidize the film to a domed shape on the surface of the piezoelectric material (Figs. 3 and 7-9);
 - iv. dry etching the piezoelectric material together with the cured film corresponding to thickness distribution of the domed shape (Figs. 3 and 7-9; 29:1-9); and
 - v. the solvent vapor is diluted with inert gas (*inherent because operation performed in the presence of air (nitrogen)*).
- b. In addition to the above limitations, *Barber et al* does not expressly disclose curing the dome-shaped film.
- i. However, *Hwu et al* teaches curing the dome-shaped film. The advantage of curing the dome-shaped film is to stabilize the film. Therefore, it would have been obvious to cure the dome-shaped film to stabilize the film.

Claims 2 and 6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Barber et al* (US Patent Publication 2002/0022292) in view of *Hwu et al* (US Patent Publication 2004/0016718) and further in view of *Aoki* (US Patent 5,646,657).

- a. In addition to the limitations in claims 1 or 3, *Barber et al* as modified does not expressly disclose that the surface of the piezoelectric material is partially treated with an oil repellant.
- i. However, *Aoki* teaches that the resist contains an oil repellant (4:4-15). The advantage of treating the surface of the piezoelectric material with an oil repellant is to prevent oil and oil-based liquids

from entering the material surface and changing the etch rate of the piezoelectric material. Thus, it would have been obvious to treat the surface of the piezoelectric material with an oil repellant to prevent oil and oil-based liquids from entering the material surface and change the etch rate of the piezoelectric material.

Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Barber et al* (US Patent Publication 2002/0022292) in view of *Hwu et al* (US Patent Publication 2004/0016718) and further in view of *Hladovcak et al* (US Patent 4,487,828).

- a. In addition to the limitations in claim 3, *Barber et al* as modified does not expressly disclose that the dome-shaped film is cured by UV irradiation.
- i. However, *Hladovcak et al* teaches curing a resist by UV irradiation (2:13-21). The advantage of curing a resist by UV irradiation is to utilize a well known process to harden and stabilize a resist. Therefore, it would have been obvious to cure a resist by UV irradiation to utilize a well known process to harden and stabilize a resist.

Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Barber et al* (US Patent Publication 2002/0022292) in view of *Hwu et al* (US Patent Publication 2004/0016718) and further in view of *Kim et al* (US Patent 6,530,652).

- a. In addition to the limitations in claim 3, *Barber et al* as modified does not expressly disclose that the dry etching is conducted by using a perfluorocarbon, chlorine, or iodide gas.
- i. However, *Kim et al* teaches dry etching is conducted by using chlorine gas (7:17-22). The advantage of dry etching by using chlorine gas is to utilize a well known process to remove material. Therefore, it would have been obvious to dry etch by using chlorine gas to utilize a well known process to remove material.

Response to Arguments

Applicant's arguments with respect to claim 3/18/08 have been considered but are moot in view of the new grounds of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David P. Angwin whose telephone number is 571-270-3735. The examiner can normally be reached on 7:30 AM - 5 PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bryant, can be reached on 571-272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. Dexter Tugbang/
Primary Examiner
Art Unit 3729

DPA